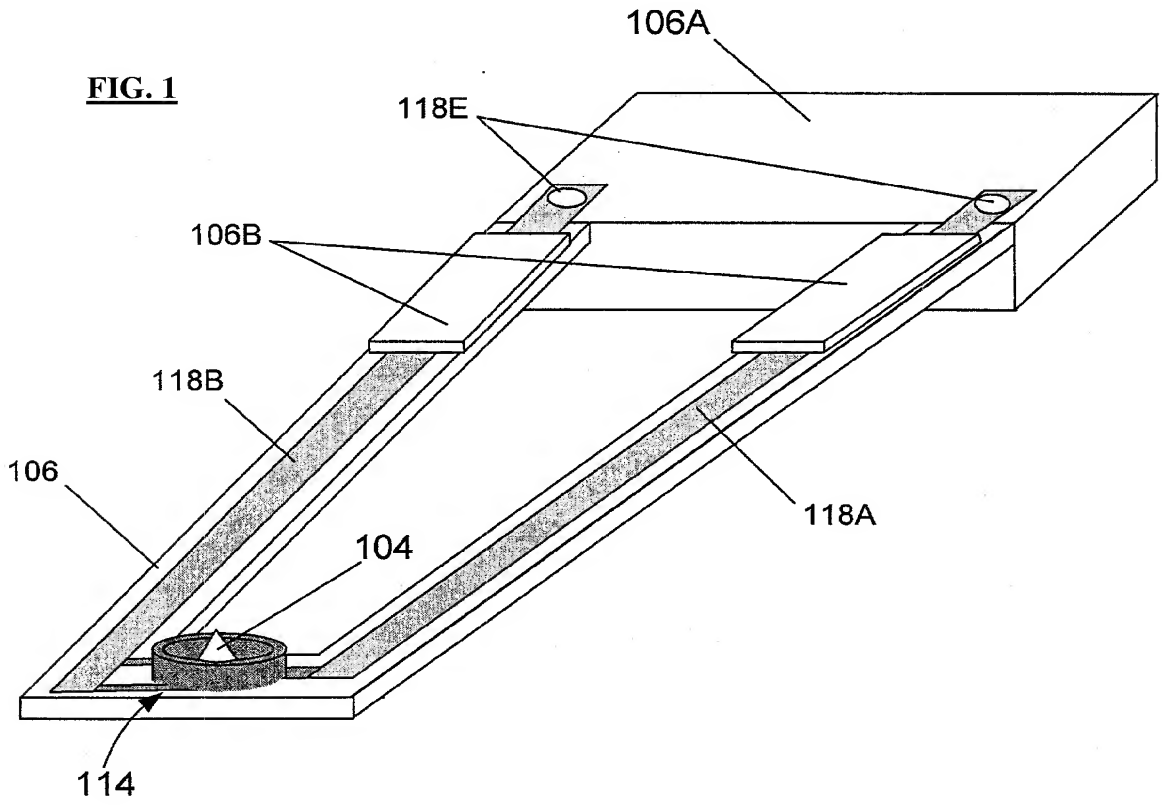
REMARKS

The above amendments and following remarks attend to each and every rejection and objection presented in the pending November 27, 2007 Office Action. Claims 1-23 are pending in the current application. Claims 1, 11, 14, 17 and 20 are independent claims. Claims 1, 4, 11, 14 and 17 have been amended. Claims 2, 9 and 19 have been canceled. Claims 20-23 are new. No new matter has been added through these amendments.

A brief summary of the present application may be helpful before proceeding to the specific rejections presented by Examiner. To generally summarize, the immediate application teaches a read mechanism used in a contact atomic resolution storage system, and associated method of use. More specifically, in at least one embodiment as shown in FIG. 1 a cantilever **106** is provided having a probe **104** and a sensor support extension or "pod" **114** proximate to and generally around the probe **104**. It is also clear that the pod **114** rises from the surface of the cantilever **106** for at least part of the height of probe **104**. Moreover, the probe **104** is at least partially enclosed by the pod **114**, and a physical space is defined between the probe **104** and the pod **114**.

FIG. 1



As shown in FIGs. 2 and 3, the pod **114** has a sensor element formed in the face that is oriented towards the medium **101**, and in at least one embodiment the sensor element is part of a field effect transistor. By placing the sensor element in the face of the pod **114** the sensor is thereby brought closer to the substrate **102**. As the pod **114** brings the elements of the sensor, e.g. FET **108**, closer to the surface of the media **101** and reduces the distance from the substrate **102**, the sensor's response characteristics are improved. See ¶19-21. "That is to say, with the provision of the pod **114**, not only is the FET exposed to a more intense electric field, but the relative change in distance "h" between the FET and the media **101** ($\Delta h/h$) which occurs in the event that the probe **104** enters a recess formed in the medium **101**, is increased." ¶21. The physical space between the pod **114** and the probe **104** is also easily appreciated in FIG. 2.

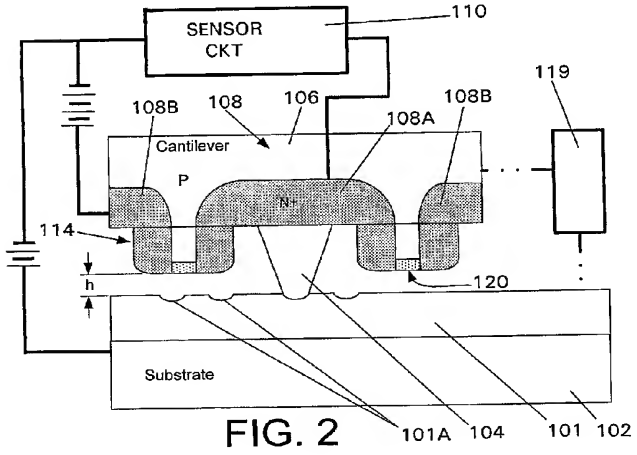


FIG. 2

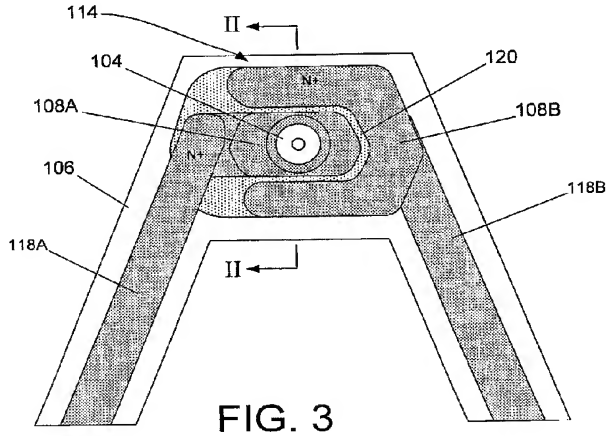


FIG. 3

Claim Rejection – 35 U.S.C. §102

Claims 1-3 and 5-8 have been rejected under 35 U.S.C. § 102(b) on the basis of being anticipated by US 6,477,132 to Azuma et al. (hereinafter, "Azuma"). Claim 17 has been rejected under 35 U.S.C. § 102(b) on the basis of being anticipated by US 6,249,747 to Binnig et al. (hereinafter, "Binnig"). Applicant respectfully disagrees and traverses these rejections.

With respect to Examiner's § 102 rejection, respectfully, to anticipate a claim, Azuma **must teach each and every element of the claim**, and "**the identical invention must be shown in as complete detail as contained in the ... claim**." *MPEP 2131* citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added).

Applicant respectfully submits that many differences exist in the claimed elements between Azuma and Applicant's claimed invention such that Azuma can not be said to anticipate Applicant's invention.

A brief review of Azuma may be beneficial in appreciating how and why Azuma fails to anticipate Applicant's claim 1. Moreover, Azuma teaches a cantilever **109** having a pyramid-shaped sensing needle **110** and a gate electrode **106** connected to the sensing needle **110** arranged on the front end of the cantilever main body **109**. Col. 10, lines 6-9. This is clearly shown in FIG. 4. Indeed the relationship of the sensing needle **110** being on the gate electrode **106** is even more clearly shown in FIG. 6. Azuma clearly fails to demonstrate any structure, let alone a sensor structure such as the Applicant's pod which extends from the cantilever **109** adjacent to the probe **110**.

FIG. 4

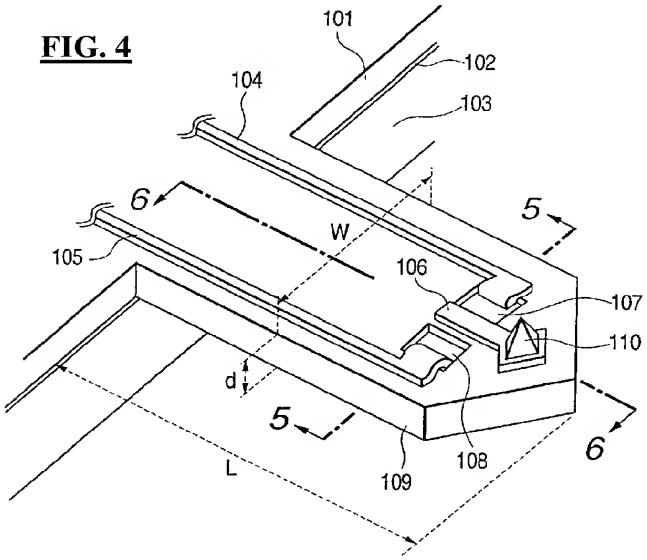
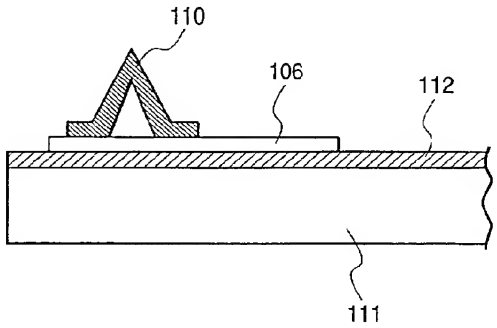


FIG. 6



Applicant has amended Claim 1 such that it now reads:

1. A read mechanism used in a contact atomic resolution storage system, comprising:
   a cantilever disposed with a medium which is movable relative to the cantilever, the cantilever having a probe which extends from the cantilever a first distance and which contacts a surface of the medium;
   a pod formed circumferentially about and spaced apart from the probe, the pod extending from a side of the cantilever facing the medium ***and defining a physical space between the pod and the probe*** along a portion of the first distance; and
   a **sensor element formed on a distal edge of the pod**, opposite from the cantilever, so as to juxtapose the medium.

With respect to this claim 1 it is clear that Azuma fails to anticipate Applicant's invention on several counts. For example, Azuma fails to teach:

1 – a pod or any structure that is formed circumferentially about and spaced apart from the probe;

2 – a physical space between the pod and the probe as they extend away from the cantilever; and

3 – a sensor element formed on the distal end of the pod

Moreover, Azuma clearly fails to teach each and every element of the claim as "**the identical invention must be shown in as complete detail as contained in the ... claim**." *Id.* Though other differences exist as well, the lack of any one of the above recited elements, let alone all three is such that Azuma can not be said to anticipate Applicant's invention as set forth in claim 1. Withdrawal and allowance of claim 1 is therefore requested.

Claim 2 has been canceled so the issue of its rejection is moot. Claims 3 and 5, 6, 7 and 8 depend from claim 1 and therefore benefit from like argument incorporated herein, and are therefore also not anticipated by Azuma. Withdrawal and allowance of claims 3, 5, 6, 7 and 8 is therefore respectfully requested.

As for the rejection to claim 17, Binnig appears to teach a storage device involving a cantilever **12** with tip **11**. As cited to by the Examiner, in col. 6, lines 7-20:

> In FIG. 3, the relative position of the storage device (generally depicted with reference numeral **1**) with respect to a storage medium **2** ("sample") is shown. The storage device comprises a cantilever **12** which is similar to the cantilever as used in an AFM; at the free or distal end of the cantilever **12** a read/write tip **11** orthogonally projecting from the cantilever **12** towards the storage medium **2** is provided (the tip **11**, thus, corresponding to the "investigation and/or manipulation tool" in the terms of the appended claims). The cantilever **12**, therefore, has the function of a support for the tip **11**; however, other types of support means, such as spring elements or a diaphragm, may be used as well; in any case, the respective support means must be able to move the tip **11** relatively (i.e. substantially in vertical direction) to the surface of the sample **2**.

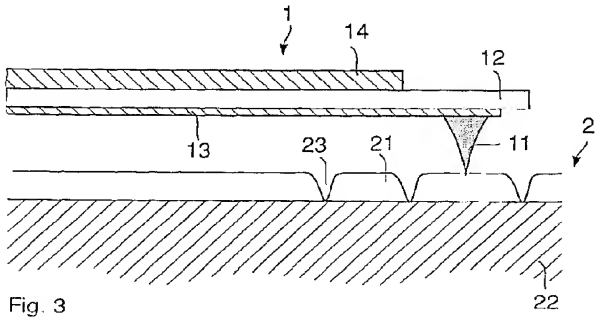


Fig. 3

With respect to this description and this figure it is clear that Binnig does not teach a pod or any structure adjacent to the probe 11 which may be considered a pod.

Moreover, Applicant has amended claim 17 to now read as:

> 17. A method of using a read mechanism for a contact atomic resolution storage system comprising:
> moving a probe relative to a medium which has a data indicative topography that is followed by the probe, ***the probe nested within and extending beyond an upper edge of a generally concentric sensor support extension pod***, the probe and the pod supported by a cantilever; and
> sensing a change in distance between the cantilever and the medium using a change in current flowing through ***a sensor element formed in the upper edge of the sensor support extension pod*** juxtaposed to the medium.

With respect to this claim 17 it is clear that Binnig fails to anticipate Applicant's invention on several counts such as:

1 – a sensor support extension pod;

2 – a probe nested within and extending beyond the upper edge of the sensor support pod; and

3 – a sensor element formed in the upper edge of the sensor support extension pod.

As Binnig fails to teach a sensor support extension pod let alone a sensor in the upper edge of the sensor support extension pod, Binnig cannot anticipate sensing a change in the distance between the cantilever and the medium using a change in the current flowing through the sensor element that is located in the upper edge of the sensor support extension pod.

Moreover, Binnig clearly fails to teach each and every element of the claim as "**the identical invention must be shown in as complete detail as contained in the ... claim**." *Id.* Though other differences exist as well, the lack of any one of the above recited elements, let alone all three is such that Binnig can not be said to anticipate Applicant's invention as set forth in claim 17. Withdrawal and allowance of claim 17 is therefore requested.

Claim Rejection – 35 U.S.C. §103

Claims 4, 10, 11-16 and 18 are rejected under 35 U.S.C. §103(a), as being unpatentable over Azuma in view of US 5,610,898 to Takimoto et al., hereinafter "Takimoto" for claim 4, Azuma in view of Binnig for claims 10 and 18, and Azuma in view of US 6,477,132 to Hopson et al., hereinafter "Hopson" for claims 11-16. Applicant respectfully disagrees with and traverses these rejections.

The standard for making an obviousness rejection is currently set forth in MPEP 706.02(j):

> To establish a *prima facie* case of obviousness, *three basic criteria must be met*. **First**, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. **Second**, there must be a reasonable expectation of success. **Finally**, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The ***teaching or suggestion*** to make the claimed combination **and** the ***reasonable expectation of success* must *both be found in the prior art,* and not *based on Applicant's disclosure***. (emphasis and formatting added) MPEP § 2143, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).
>
> The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a ***convincing line of reasoning*** as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). (emphasis added). *See also, KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. ___ (2007).

Therefore, if the above-identified criteria are not met, then the cited reference(s) fails to render obvious the claimed invention and, thus, the claimed invention is distinguishable over the cited reference(s). Respectfully, the October 16, 2007 Office Action has failed to meet this burden.

Moreover, the Examiner must show that some reason to combine the elements with some rational underpinning that would lead an individual of ordinary skill in the art to combine the relevant teachings of the references. *KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. ___ (2007); *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). Therefore, a combination of relevant teachings alone is insufficient grounds to establish obviousness, absent some reason for one of ordinary skill in the art to do so. *Fine* at 1075.

Under the analysis required by *Graham v. John Deere*, 383 U.S. 1 (1966) to support a rejection under §103, the scope and content of the prior art must first be determined, followed by an assessment of the differences between the prior art and the claim at issue in view of the ordinary skill in the art.

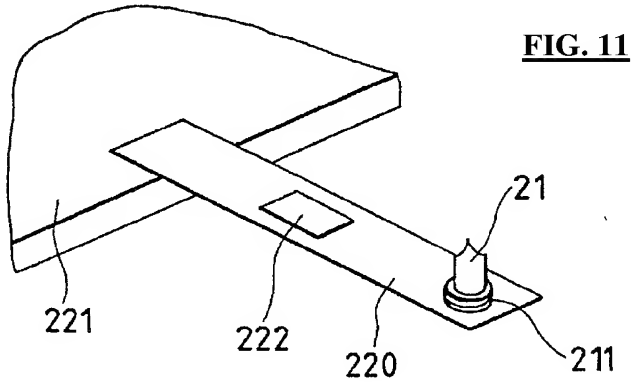
Claim 4: Azuma in view of Takimoto

With respect to claim 4, as noted above Azuma fails to teach Applicant's sensor support extension pod **114**. There is no teaching, suggestion or motivation anywhere within Azuma for a structure such as pod **114**. This deficiency is not spontaneously overcome through the addition of Takimoto.

Respectfully, Takimoto teaches an elastic member supporting a probe electrode. Col. 5, lines 10-13. Examiner has cited to element **211** shown in FIG. 11 to support a view of Takimoto teaching Applicant's pod.

> Next explained is the elastic support mechanism **22** of the fourth embodiment with reference to FIG. 11. In FIG. 11, referential numeral **21** is a probe electrode which is made of tungsten with a diameter of 25 μm pin-pointed in the electrolytic polishing method, **220** an elastic member made of Au leaf of 1 mm in length, 0.2 mm in width, and 10 μm in thickness, ***211*** *an adhesion portion made of conductive adhesive securing the probe electrode **21** to the elastic member **220***, and **221** a base for fixing the other end of the elastic member **220** on the side away from the probe electrode. (Col. 13, line 60 – Col 14. line 7, emphasis added)

FIG. 11



Element **211** is conductive adhesive which Takimoto teaches to be used for securing the probe **21** to the elastic member **220**, e.g. the cantilever. There is no teaching, suggestion or motivation to view this conductive adhesive material **211** to be anything more than conductive adhesive material.

Takimoto does not teach or suggest that the adhesive material **211** extends from the side of the cantilever and defines a physical space between itself and the probe **21**.

Takimoto does not teach or suggest that the adhesive material **211** provides a sensor element formed in or on the distal edge of the adhesive material **211**.

Examiner's statement on Page 4 that "[o]ne of ordinary skill in the art at the time of applicant's invention would have been motivated to provide an annular pod in order to support the probe during wear caused by contact with the medium" evidences Examiner's apparent misperception of the pod as set forth by Applicant. Applicant is not providing the pod **114** to support the probe against wear. Applicant is providing the pod **114** to bring the sensor closer to the surface of the media **101** and reduce the distance from the substrate **102**, see Applicant's disclosure ¶ 21.

Combining Takimoto with Azuma appears to teach the use of an adhesive material **211** (from Takimoto) to connect the sensing needle **110** to the cantilever **109** (from Azuma). Nowhere in either reference is the Applicant's pod **114** taught, suggested or even implied. The combination of references is insufficient to provide Applicant's disclosed invention.

Without some reason in the references to combine the cited prior art teachings, with some rational underpinnings for such a reason, the Examiner's conclusory statements in support of the alleged combination fail to establish a prima facie case for obviousness. *See, KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. ___ (2007) (obviousness determination requires looking at "whether there was an apparent reason to combine the known elements in the fashion claimed...," *citing In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness," *KSR* at 14).

As the prior art references do not combine to render obvious independent claim 1 let alone dependent claim 4, Applicant respectfully submits that the Examiner has not made a prima facie case of obviousness for the elements of claim 4. For at least these reasons, withdrawal of the Examiner's rejection and allowance of claim 4 is therefore respectfully requested.

Claims 10 and 18: Azuma in view of Binnig and vis-a-versa

With respect to claims 10 and 18, it is again noted that Azuma fails to anticipate, let alone render obvious, claim 1. Binnig has also been discussed with respect to claim 17, which now further describes the structure and physical relationship of probe **104** and pod **114**. These features are of course present in claim 1, such that the above arguments are incorporated herein by reference.

Moreover, the Azuma and Binnig references when combined utterly fail to teach, suggest or in any way imply all of the claimed elements set forth by Applicant in either claim 10 or claim 18. Examiner's statements that one of ordinary skill would be motivated to detect change in distance and that the sensor element which might be employed for sensing such change in distance could be part of a FET sensor fails to fully appreciate Applicant's teaching.

Applicant respectfully submits that the Examiner has not made a prima facie case of obviousness for the elements of claims 10 or 18. For at least these reasons, withdrawal of the Examiner's rejection and allowance of claims 10 and 18 is therefore respectfully requested.

Claims 11-16: Azuma in view of Hopson

With respect to claims 11-16, once again Applicant respectfully incorporates the above statements regarding the failure of Azuma to teach, suggest or imply the pod as set forth by Applicant.

Applicant has amended independent claims 11 and 14 so as to assist the Examiner in more fully appreciating the distinct aspects of Applicant's invention. Claim 11 now states:

> 11. A read mechanism used in a contact atomic resolution storage system, comprising:
> a cantilever disposed with an electrically non-conductive medium which is movable relative to the cantilever, the cantilever having a probe which extends from the cantilever a first distance and which follows a topography of the medium;
> ***a sensor pod formed in proximity to and circumferentially about the probe, the pod extending toward the medium and defining at least one physical space between the pod and the probe along a portion of the first distance***; and
> a device formed in the cantilever which responds to a change in distance between the cantilever and a substrate on which the medium is supported.

Claim 14 now states:

> 14. A method of making a read mechanism for a contact atomic resolution storage system comprising:
> forming a cantilever having a movable end;
> ***forming an annular sensor support extension pod*** on the cantilever proximate to the movable end, ***the pod having an edge rising above the surface of the movable end***;
> ***forming a probe on the cantilever disposed within the annular pod and extending beyond the edge so as to have a predetermined spatial relationship with the pod***;
> orienting the pod and the probe towards a medium which is movable relative to the probe and in which a data indicative topography is formed; adapting the probe to follow a data indicative topography of the medium; and
> ***forming a sensor element in a portion of the pod edge*** juxtaposed to the medium.

As stated by Examiner on Page 5 of the current Office Action, "Azuma fails to disclose a device formed in the cantilever which responds to a change in distance between the cantilever and a substrate on which the medium is supported." This is of course not the only element which Azuma fails to teach, suggest or imply. Among the other differences noted above, Azuma fails to teach, suggest or imply the pod, the space between the pod and the probe, the sensor in the pod edge.

Hopson teaches an enhanced probe for gathering data from semiconductor devices. As in the passage cited to by Examiner,

> Probe tip **10** is capable of providing signals that facilitate simultaneous formation of thermal images, topographical images, and additional information such as

capacitance, electrical field, magnetic field, and the like, of a semiconductor device or material (not shown). Probe **10** includes an amplifier **12** formed therein, and more particularly a metal oxide semiconductor (MOS) transistor, formed therein (as illustrated in FIG. 4), that provides for the receipt and amplification of a produced electrical signal representing information gathered from the semiconductor device." Col. 2, lines 55-65.

Examiner also refers to FIG. 3, which presents a cross section view of the probe **10**, and, "as illustrated, stack **30** is etched to define probe tip **10**. More particularly, stack **30**, including N doped wells **24**, P doped material **20**, optional layer **16**, and substrate **14** are etched to define probe tip **10**, including sidewalls **32**, and tip point **34**." Col. 3, lines 30-34.

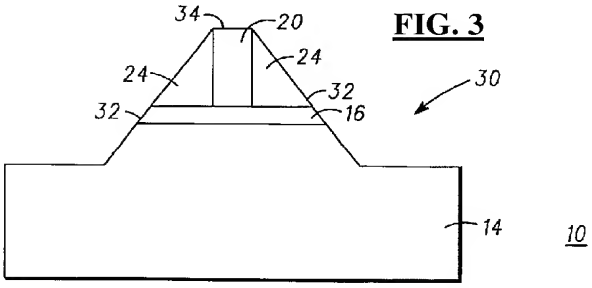


FIG. 3

Respectfully, Hopson is not teaching a sensor pod formed in proximity to and circumferentially about the probe, the pod extending towards the medium and defining at least one physical space between the pod and the probe. Hopson is not teaching the forming of such a pod, or that such a pod has an edge, or further that a sensor element is formed in a portion of that edge. Hopson is also not teaching forming a probe disposed within the annular pod and extending beyond the edge.

Moreover although Hopson appears to teach a probe for gathering data, the Azuma and Hopson references when and if combined still do not teach, suggest or in any way imply all of the claimed elements set forth by Applicant in claims 11-16. Applicant respectfully submits that the Examiner has not made a prima facie case of obviousness for the elements of claims 11-16 and elements are clearly missing. For at least these reasons, withdrawal of the Examiner's rejection and allowance of claims 11-16 is therefore respectfully requested.

With respect to all of the above rejections, to summarize, with respect to Azuma, Takimoto, Binnig and Hopson, Applicant contends that the scope and content of the prior art references as discussed above unequivocally fail to set forth the pod, probe, spatial relationship between the pod and probe, and sensor formed at least partially within the pod as Applicant teaches in the description, sets forth in the accompanying figures and states clearly in the pending claims.

Applicant respectfully asserts that with respect to all of these references, whether taken separately or in any combination, the references can not and do not yield Applicant's disclosed structure or method. There is no rational underpinning that would lead an individual of ordinary skill in the art to attempt any such combinations and spontaneously modify and further develop additional structures that are not taught or suggested.

Applicant has included relevant figurers from Applicant's own application as well as the cited references so as to facilitate the above discussion and clear differences between the various disclosed structures. If the Examiner should wish to persist in the rejections, Applicant respectfully requests that the Examiner specifically cite to and identify in the figures where the claimed features asserted by Applicant are to be found.

New Claims 20-23

In light of the rejections presented by Examiner, and in review of the application to prepare the above response, Applicant has noted an alternative claim format that may further assist the examiner in appreciating the patentable distinction of Applicant's contact probe storage sensor pod. No new matter is introduced with these claims, and support is amply evident in FIGs. 1-5 and, for example ¶19-22. Claim 20 is a new independent claim and now recites:

20. A read mechanism used in a contact atomic resolution storage system comprising:
a cantilever having a movable end disposed with a medium which is movable relative to the cantilever;
a generally annular pod proximate to the movable end and **extending from** a side of **the cantilever** facing the medium, **the pod having an edge juxtaposed to the medium**;
a probe disposed within the annular pod and extending beyond the pod edge to contact a surface of the medium; and
a sensor element disposed at least partially within the annular pod edge.

As the above discussion has demonstrated, and which is incorporated herein by reference, the prior art references as cited by the Examiner do not anticipate or render these elements as prima facie obvious. Claims 21-23 depend from claim 20 and therefore benefit from like argument and patentable distinction over the prior art references as cited. Accordingly, Applicant respectfully requests allowance of claims 20-23.

Conclusion

In view of the above Remarks and the amendment to the claims, Applicant has addressed all issues raised in the Office Action dated November, 27 2007, and respectfully solicits a Notice of Allowance for claims 1, 3-8, 10-18 and 20-23. Should any issues remain, the Examiner is encouraged to telephone the undersigned attorney.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made

above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicant believes that no fees are due; however, should any fee be deemed necessary in connection with this Amendment and Response, the Commissioner is authorized to charge deposit account 08-2025, referencing the Attorney Docket Number 200310877-1.

Respectfully submitted,

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